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CYCLIZATION OF (*Z,Z*)-1,4-BIS-(ALKYLSELENO)-1,4-DIPHENYL-1,3-BUTADIENES TO 2,5-DIPHENYLSELENOPHENE

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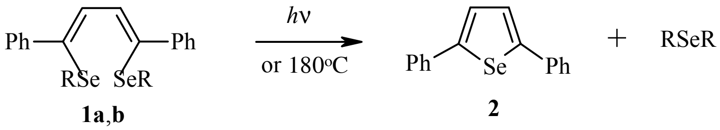
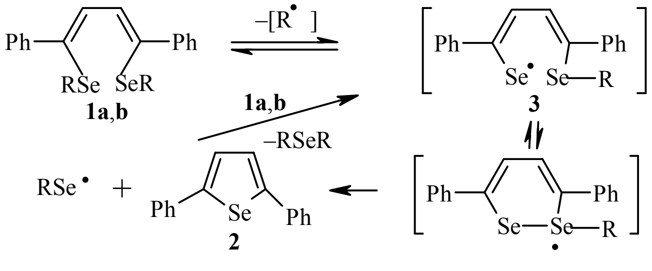
Keywords: (*Z,Z*)-1,4-bis(alkylseleno)-1,4-diphenyl-1,3-butadienes, 2,5-diphenylselenophene, cyclization.

We have observed a previously unknown reaction: conversion of (*Z,Z*)-1,4-bis(alkylseleno)-1,4-diphenyl-1,3-butadienes **1a,b** to 2,5-diphenylselenophene (**2**) and dialkyl selenides. On exposure to UV radiation, compound **1a** is converted to heterocycle **2** in 33% yield. Heating compounds **1a,b** at 180°C in a sealed ampul in chloroform solution leads to formation of heterocycle **2** in 52% (**1a**) and 30% (**1b**) yields. The yields are calculated based on the amount of compounds **1a,b** used, and are not optimized.



1 a R = *i*-Pr, **b** R = Et

We may hypothesize that the reaction proceeds according to a radical chain mechanism. A possible route for the formation of heterocycle **2** includes homolytic rupture of the Se–C bond in compounds **1a,b** with formation of the radical intermediate **3**. The selenenyl radical **4** formed along with heterocycle **2** in the last step of the process can react with the starting compounds **1a,b**, yielding intermediate **3**, which begins a new chain of transformations.



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2,5-Diphenylselenophene (2); mp 171-172°C (corresponds to literature data [1]). Mass spectrum, *m*/*z*: 284 $[M^{+\cdot}]$. ^1H NMR ($CDCl_3$): 7.56 (4H, m, *ortho*); 7.44 (2H, s, CH); 7.36 (4H, m, *meta*); 7.28 (2H, m, *para*). Found, %: C 68.03; H 4.34; Se 27.55. $C_{16}H_{12}Se$. Calculated, %: C 67.85; H 4.27; Se 27.88.

Compounds **1a,b** have been synthesized by nucleophilic addition to diphenyldiacetylene of alkaneselenolate anions generated under the process conditions from dialkyldiselenides according to the familiar procedure in [2,3].

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